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INFLUENCE OF DRIP IRRIGATION AND PLANTING SYSTEMS ON YIELD AND QUALITY IN SUGARCANE VARIETIES OF TAMIL NADU

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ABSTRACT

Irrigation has become an interesting cultural practice to improve crop yield and sustainability in adequate and marginal sugarcane growing areas. Field experiments were conducted at Sugarcane Research Station, Cuddalore, Tamil Nadu, India in one plant and three ratoon crops to optimize the paired row spacing for sugarcane with and without drip irrigation. Three varieties viz., CoC (SC) 22, CoSi 6 and CoC (SC) 23 were evaluated in different row spacing. In the plant crop, the paired row spacing at 30x30x30x105 cm registered the maximum cane yield of 148.6 t ha^{-1} followed by 30x30x30x120 cm with 147.1 t ha^{-1}, however the normal spacing without drip recorded the cane yield of 125.4 t ha^{-1}. The cane yield decreased with increasing paired row spacing from 105 to 165 cm and the reduction was in the order of 8.4%, 13.7% and 15.8% at 135, 150 and 165 cm respectively. In ratoon crops, the normal row spacing with drip exhibited vigorous growth with the higher cane yield of 129.7,136 and 135.1 t ha^{-1} respectively in the first, second and third ratoons. However, among the paired row spacing, the spacing at 30x30x30xl05 cm registered higher cane yield. The variety CoC (SC) 23 recorded the maximum cane yield of 140.4 t ha^{-1} in plant crop and CoC (SC) 23 registered higher cane yield in all the ratoons. In the juice quality analysis much variation was not observed for the different row spacing. The variety CoC(SC) 23 registered higher CCS in both plant and ratoon crops followed by CoSi 6.

KEYWORDS: Commercial Cane Sugar, Mechanization, Row Spacing, Planting Technique, Sustainability

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INTRODUCTION

India will be the world's second largest producer of sugarcane. Tamil Nadu contributes approximately 7 % of the national production. India's average water utilization for the 5.2 m ha of sugarcane produced is around 104 BCM/yr (Shrivastava et al., 2011).Drip irrigation in sugarcane can play a pivotal role to increase yield as well as save precious water in a state like Tamil Nadu. Now –a-days, wider spacing is being advocated for twin purposes. One is for robust and healthy growth of cane. Another is to facilitate mechanization for easy harvesting. Determination of precise planting technique to improve uniformity in plant population and crop stand is an important issue for improving sugarcane productivity. Paired row (60:30 cm) planting is better over planting in single rows, either at 90 cm or at 60 cm (Bhullar et al., 2002). Crop geometry under drip irrigation system significantly influenced cane yield and the highest yield of 130.64 t/ha was recorded with 75 cm row spacing followed by 126.13 t/ha at 90 cm row spacing (Bhunia et al., 2013). The scientific information on effect of these

planting techniques on sugarcane crop for coastal soils of Cuddalore district is lacking, keeping this in view, the present study was planned to work out a suitable combination of planting method with drip irrigation for achieving higher productivity and profitability in sugarcane varieties.The objective of this study were to evaluate the suitability of sugarcane varieties and planting systems with and without drip irrigation on yield and quality of sugarcane.

METHODS

Field experiments were conducted at Sugarcane Research Station, Cuddalore in one plant crop and three ratoon crops in strip plot design with three replications during 2006- 2010. The fertilizer N and K was given through drip at 14 equal splits starting from the 15 th day of planting at 15 days interval. Phosphorus fertilizer was applied as basal. The recommended fertilizer schedule was 300:100:200 kg NPK/ha.

Treatment Schedule

Factor A - Planting Systems with Drip Irrigation

- Normal spacing at 80 cm apart with drip
- Paired row spacing with drip (120+40 cm)
- Paired row spacing with drip (30+30+30+105 cm)
- Paired row spacing with drip (30+30+30+120 cm)
- Paired row spacing with drip (30+30+30+135 cm)
- Paired row spacing with drip (30+30+30+150 cm)
- Paired row spacing with drip (30+30+30+165 cm)
- 80 cm apart without drip – adjacent field

Factor B – Sugarcane Varieties

- CoC (SC) 22
- CoSi (SC) 6
- CoC (SC) 23

RESULTS AND DISCUSSIONS

The results on growth parameters yield and yield attributes were recorded in one plant crop (Table.1) and three ratoon crops (Table 2, 3 & 4) are presented below.

Germination and Sprouting Percentage

The germination was more than 80% in all the planting methods with the maximum of 83.3% at 165 cm spacing in plant crop (Table.1). The variety CoC (SC) 22 registered 85.4% germination, while CoC (SC) 23 recorded 83.9% germination.

In first ratoon crop (Table.2), CoC (SC) 23 produced the maximum of 137722 sprouts/ ha, followed by CoC (SC) 22 and CoSi 6 with 133542 and 130805 sprouts/ ha respectively. The normal planting with 80 cm apart registered the

maximum of 157361 sprouts/ ha followed by the planting system of 30+30+ 30 + 105 cm with 140812 sprouts/ ha. The result on sprout population of second ratoon crop (Table.3) results revealed that CoC (SC) 23 registered the higher sprout population of 138555 ha^{-1} followed by CoC (SC) 22 with 134554 sprouts ha^{-1} and CoSi6 produced only 128896 sprouts ha^{-1}. The normal row spacing of 80 cm apart recorded the higher sprout population of 162049 and it is on par with the paired row planting system of 30+30+30+ 105 cm with 161864 sprouts ha^{-1}. Significant variation existed among the various paired row spacing with respect to sprout population in third ratoon crop (Table.4). The normal row spacing at 80 cm apart with drip irrigation produced the maximum of 161600 sprouts ha^{-1} followed by the paired row spacing at 120+40 cm with 143778 sprouts ha^{-1}. Shrivastava et al., (2012) also recorded that the moisture distribution pattern under paired-row planting was observed to be different as compared to conventional planting pattern**.** The paired row spacing at 105 and 120 cm produced 134040 and 126256 sprouts ha^{-1} respectively. The variety CoC (SC) 23 produced the maximum of 134244 sprouts ha^{-1} followed by CoC (SC) 22 with 130443 sprouts ha^{-1}.

Tiller Population (Tables 1-5)

The tiller population was maximum with 2,75,347 tillers/ ha in the normal planting of setts at 80 cm apart, followed by planting the setts in the paired row system of (20+40 cm) with 2,59,757 tillers / ha in plant crop**.** The tiller population was 2, 26,382 / ha at 30+30+30+105 cm and further increasing the row spacing resulted in the gradual reduction of tiller population. The variety CoC (SC) 23 produced the maximum of 2, 32,018 tillers/ha followed by CoC (SC) 22 with 2, 22,011 tillers/ ha. The variety CoC (SC) 23 produced the maximum of 217465 tillers ha^{-1} followed by CoC (SC) 22 and CoSi 6 with 206473 and 201508 tillers ha^{-1} respectively in first ratoon crop. Among the planting systems, the normal planting 80 cm apart produced the maximum of 253681 tillers ha^{-1} and there is gradual reduction in tiller population, when the cane was planted in the wider parallel row system of planting. The increased spacing of 165cm resulted in the decrease of nearly 30% of the tiller population. The varieties CoC (SC) 23 and CoC (SC) 22 produced the higher tiller population of 223457 and 223265 tillers ha^{-1} respectively and CoSi 6 recorded 210394 tillers ha^{-1} in second ratoon crop. Among the planting systems, significantly higher tiller population of 263264 tillers ha^{-1} was observed at the normal row spacing of 80 cm apart and paired row spacing at 30+30+30+105 cm produced 231757 tillers ha^{-1}. The reduction in tiller population was in the order of 12%, 16.6%, 20.9%, 24.6% and 28.1% at the paired row spacing of 105,120,135,150 and 165 cm respectively over the normal row spacing of 80 cm. CoC (SC) 23 at the normal row spacing of 80 cm apart produced the maximum tiller population of 269063 ha^{-1}. Maximum of 253924 tillers ha^{-1} was produced in the normal row spacing followed by paired row spacing of 105 cm and 120 cm in the 234700 and 229314 tillers ha^{-1} in third ratoon crop. The tiller population reduction was in the order of 24.8%, 21l.1%, l7.6%, 9.7%. 66% at 165, 150,135,120 and 105 cm over the normal row spacing. Among the varieties CoC (SC) 23 recorded 223557 tillers ha^{-1} followed by CoC (SC) 22 is 223390 tillers ha^{-1}. The paired row system of planting is found to be beneficial or inevitable nowadays because of the necessity to enrich soil fertility by in situ trash decomposition and necessity to reduce installation cost of drip irrigation system (Gaddanakeri et al., 2007).

Millable Cane Population

In the normal planting method, the cane population was maximum with 1, 43,816 canes/ha and the population is reduced by 11.2% at 120+40 cm paired row planting in first plant crop (Table.1). The system at 30+30+30+105 cm produced 1, 31,681 canes/ha. However at the wider row spacing of 165 cm, the population was only 1,11,612/ ha. The varieties differ significantly in their cane production ability and CoC (SC) 23 produced the maximum of 1, 28,314

shoots/ha. The other two varieties viz., CoC (SC) 22 and CoSi (6) produced 1, 24,688 and 1, 22,713 canes/ha respectively.The variety CoC (SC) 23 produced the maximum of 127039 shoots ha^{-1} followed by CoC (SC) 22 with 121233 shoots ha^{-1} in first ratoon crop (Table.2). and CoSi 6 registered 118570 shoots ha^{-1}. Among the planting systems, the normal planting at 80 cm apart recorded the maximum of 142952 shoots ha^{-1} followed by the paired row spacing of 30+30+30+105 cm with 126206 shoots ha^{-1}. The paired row spacing of 120 + 40 cm produced 126146 shoots ha^{-1} and minimum shoot population of 107310 ha^{-1} was observed in the wider row spacing of 30+30+30+165 cm. The population reduction was worked out to be 1l.7%, 14.6%, 17.1%, 2l.1% and 24.9% at 105 cm, 120 cm, 135 cm, 150 cm and 165 cm paired row spacing over the normal spacing of 80 cm apart. Among the three varieties, CoC (SC) 23 registered the maximum cane population of 127376 ha^{-1} followed by CoC (SC) 22 with 124909 shoots ha^{-1} in second ratoon crop (Table.3). The normal row spacing at 80 cm apart registered significantly the higher shoot population of 148785 shoots ha^{-1} and paired row spacing at 30+30+30+105 cm registered 128457 shoots ha^{-1}. There was a gradual reduction in cane population by increasing the paired row spacing from 105 to 165 cm. In the third ratoon crop (Table.4), the variety CoC (SC) 23 significantly produced higher cane population of 128731 ha^{-1} followed by CoC (SC) 22 with 125868 canes ha^{-1} and variety Co Si 6 produced only 118789 canes ha^{-1}. Significant variation was observed among the planting systems for the cane population and raising the cane in the normal pacing of 80 cm apart with drip irrigation for each row registered the higher cane population of 150208 ha^{-1}. Among the paired row systems of planting, raising the cane at (20+40) cm produced 130625 canes ha^{-1} which was on par with the spacing of 30 x 30 x 30 x105 cm that produced 129765 canes ha^{-1}. Increasing the row spacing beyond 120 cm resulted in the decrease of cane population by 9%. 10%. 14.4% and 17.4% at 120,135 150 and 165 cm over 105 cm.

Commercial Cane Sugar Per Cent (CCS %)

Appreciable difference in juice quality was not observed among the planting techniques in plant and ratoon crops. In plant crop, parallel row planting at 30+30+30+120 cm and 30+30+30+105 cm recorded 13.00% and 12.94% CCS respectively. Better quality with 14.17% CCS was observed in variety CoC (SC) 23, whereas the CCS was only 12.8% and 11.36% in CoSi (SC) 6 and CoC (SC) 22. In first ratoon crop, raising the cane at the normal row spacing of 80 cm apart registered the CCS of 11.56%, followed by the paired row spacing of 30+ 30+ 30+ 165 cm with 11.49% CCS. Among the varieties CoC (SC) 23 recorded the maximum of 12.94% CCS which was significantly superior to CoSi 6 that recorded 11.14% CCS and CoC (SC) 22 recorded only 10.13 % CCS. However raising the cane at the normal row spacing of 80 cm apart and the paired row spacing of 30+30+30+105 cm registered the CCS of 11.60% in second ratoon crop. Bhunia et al. (2013) recorded that commercial cane sugar was also highest with 75 and 90 cm row spacing than paired row spacing. The variety CoC (SC) 23 recorded the maximum CCS of 12.69 % which was significantly superior to CoSi 6 (11.54%) and CoC (SC) 22 recorded 10.38% CCS. However wider spacing at 165 cm apart registered the maximum of 12.33% CCS followed by the spacing of 120+40 cm in third ratoon crop. CoC (SC) 23 registered the maximum of 13.2 % CCS followed by CoSi 6 with 12.24% CCS.

Cane Yield and Sugar Yield

Significant variation in cane yield was observed for the different planting systems evaluated in plant crop. The normal 80 cm spacing with drip irrigation recorded the cane yield of 144.3t/ha whereas there was marginal increase in cane yield at the parallel row spacing of 30+30+30+105 cm (148.6 t/ ha) and 30+30+30+120 cm (l47.1 t /ha). The cane yield decreased with increase in row spacing from 105 cm to 165 cm. Among the cultivars,CoC (SC) 23 registered the

maximum cane yield of 140.4 t/ ha followed by CoSi (SC) 6 and CoC (SC) 22 with the cane yield of 137.6 and 132.6 t/ ha respectively. Drip irrigation was reported to give enhanced yield attributes as compared to conventional method (Mahendran and Dhanalakhmi, 2003). The sugar yield followed the trend of cane yield. The variety CoC (SC) 23 registered the maximum sugar output of 19.9 t/ ha. Among the planting systems, parallel row spacing at 105 cm produced the maximum sugar yield of 19.28 t /ha followed by the row spacing of 120 cm with sugar output of 19.15 t /ha. Bhati (2014) also reported that the highest cane yield was with 75and 90 cm in single row spacing and the impact on cane yield has reflected in terms of commercial cane sugar yield. Raising the cane at the normal row spacing of 80 cm apart recorded the cane yield of 129.7 t $ha^{-1,}$ followed by the paired row planting at the spacing of 30+30+30+105 cm with the cane yield of 120.98 t ha^{-1} in first ratoon crop. Widening the spacing to 105 cm, 120 cm and 165 cm reduced the cane yield by 6.72%, 8.9% and 19.65% respectively. The variety CoC (SC) 23 registered the maximum cane yield of 117.87 t ha^{-1} followed by CoSi 6 and CoC (SC) 22 with 113.83 t ha^{-1} and 109.24 t ha^{-1} respectively. CoC(SC) 23 produced the maximum sugar yield of 15.25 t ha^{-1} which was significantly superior to other two entries CoSi 6 and CoC (SC) 22. Among the planting systems, the normal planting at 80 cm apart recorded 15.04 t ha^{-1} of sugar yield followed by the paired row spacing of 30+ 30+ 30+105 cm and 30+30+30+120 cm with 13.61 t ha^{-1} and 13.44 t ha^{-1} of sugar yield. Among the systems, raising the cane at the normal row spacing of 80 cm apart recorded the higher cane yield of 136.0 t ha^{-1}, followed by the paired row planting at the spacing of 30+30+30+105 cm with the cane yield of 125.0 t ha^{-1} in second ratoon crop. Widening the spacing to 105, 120, 135, 150 and 165 cm reduced the cane yield by 9.2%, 13%, 16.9%, 21.1 % and 25% respectively over the normal row spacing of 80 cm apart. The variety CoC (SC) 23 recorded the higher cane yield of 120.3 t ha^{-1} that was on par with CoC (SC) 22 that registered 118.9 t ha^{-1} of cane yield and CoSi 6 produced the cane yield of 113.6 t ha^{-1}. The sugar yield followed the trend of cane yield. Maximum sugar yield of 15.27 t ha^{-1} was recorded by CoC (SC) 23 followed by CoSi 6 with 13.10 t ha^{-1}. Among the planting systems, the normal planting at 80 cm apart recorded 15.8 t ha^{-1} of sugar yield followed by the paired row spacing of 30+30+30+105 cm and 30+30+30+120 cm with 14.6 and 13.7 t ha^{-1} of sugar yield respectively. The variation in cane yield due to spacing was significant in third ratoon crop also. Maximum cane yield of 135.1 t ha^{-1} was recorded by the normal row spacing followed by paired row spacing at 105 cm. The variety CoC (SC) 23 recorded the maximum cane yield of 115.6 t $ha^{\cdot 1}$ closely followed by CoC (SC) 22 with 115. 1 t ha $^{-1}$. The normal row spacing produced the maximum sugar yield of 16.36 t ha^{-1} followed by the paired row spacing at 105 cm with 14.34 t ha^{-1}. Among the varieties, CoC (SC) 23 produced significantly higher sugar yield of 15.29 t ha^{-1} followed by CoSi 6 with 13.23 t ha^{-1}.

CONCLUSIONS

The pooled result of four years revealed that irrespective of the varieties, the normal row spacing at 80 cm apart with drip irrigation for each row registered higher cane and sugar yield in both plant and ratoon crops. The sprout population, tiller population and millable cane population were also high in the normal row spacing with drip irrigation than the paired row spacing. However, the paired row spacing up to 135 cm was superior to the normal row spacing of 80 cm apart without drip irrigation. Among the paired row spacing, the row spacing at 105 and 120 cm apart registered more tiller population, number of millable canes, cane yield and sugar yield. However the cane yield reduction is evidenced at 150 cm and 165 cm paired row spacing. Though the cultivar CoC (SC) 23 registered higher cane yield in plant and first ratoon, the variety CoC (SC) 22 registered on par yield with CoC (SC) 23 in second and third ratoon. Considering the acute water scarcity and periodical drought situations, the wider row spacing at 30x30x30x105/120 cm with drip irrigation can be advocated in coastal soils of TamilNadu.

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APPENDICES

Table 1: Effect of Drip Irrigation and Planting Systems on Growth, Yield and Quality of Sugarcane Varieties– Plant Crop – I (2006-2007)

Treatments	Germination Percentage	Tiller Production (000'/ha.)	Millable Cane Population (000'/ha.)	Cane Yield (t/ha.)	CCS (%)	Sugar Yield (t/ha)
Planting systems (mean values)						
Normal 80 cm apart	83.1	275.3	143.8	144.3	12.72	18.40
Paired row (120+40 cm)	80.3	259.8	127.7	128.6	12.47	16.07
PR (30+ 30+ 30+ 105 cm)	82.6	226.4	131.7	148.6	12.94	19.28
PR (30+30+30+120 cm)	82.6	213.4	127.0	147.1	13.00	19.15
PR (30+30+ 30+ 135 cm)	83.1	20l.2	121.0	136.1	12.82	17.50
PR (30+30+30+150 cm)	82.8	190.3	113.9	128.3	12.77	16.32
PR (30+ 30+ 30+ 165 cm)	83.3	179.9	111.6	125.1	12.71	15.92
80 cm apart without drip	82.5	196.6	115.4	125.4	12.86	16.13
SEd	0.37	1.222	1.822	0.774	0.106	0.143
CD (P=0.5)	0.751	2.662	3.695	1.687	0.230	0.311
Varietal (mean values)						
CoC (SC) 23	83.9	232.0	128.3	140.4	14.17	19.90
CoSi (SC) 6	78.4	208.7	122.7	137.6	12.80	17.62
CoC (SC) 22	85.4	222.0	124.7	132.6	11.36	17.62
SEd	0.198	1.098	0.573	0.370	0.071	0.092
CD (P=0.5)	0.549	2.249	1.590	0.758	0.145	0.188

Table 2: Effect of Drip Irrigation and Planting Systems on Growth, Yield and Quality of Sugarcane Varieties —Ist Ratoon (2007-2008)

Treatments	Germination Percentage	Tiller Production (000'/ha.)	Millable Cane Population (000'/ha.)	Cane Yield (t/ha.)	CCS (%)	Sugar Yield (t/ha)
Planting systems (mean values)						
Normal 80 cm apart	157.4	253.7	142.9	129.7	11.56	15.04
Paired row (120+40 cm)	140.3	212.2	126.1	98.5	11.43	12.52
PR (30+ 30+ 30+ 105 cm)	140.8	213.4	126.2	121.0	11.22	13.61
PR (30+30+30+120 cm)	133.4	214.4	122.0	118.1	11.35	13.44
PR (30+30+ 30+ 135 cm)	127.8	199.5 I	118.5	114.3	11.44	13.10
PR (30+30+30+150 cm)	121.8	188.3 l	112.9	109.7	11.34	12.44
PR (30+ 30+ 30+ 165 cm)	116.6	177.9	107.3	104.2	11.49	11.96
80 cm apart without drip	120.6	185.7	110.4	108.6	11.47	12.46
SEd	l.132	1.326	0.672	5.799	0.146	0.205
CD (P=0.5)	2.297	2.691	1.362	12.634	NS	0.415
Varietal (mean values)						
CoC (SC) 23	137.7	217.5	127.0	117.9	12.94	15.25
CoSi (SC) 6	130.8	201.5	118.5	113.8	11.14	12.67
CoC (SC) 22	133.5	206.5	121.2	109.2	10.13	11.55
SEd	0.997	1.217	0.599	4.221	0.124	0.199
CD (P=0.5)	1.981	2.470	1.665	8.646	0.345	0.553

Table 3: Effect of Drip Irrigation and Planting Systems on Growth, Yield and Quality of Sugarcane Varieties —II nd Ratoon (2008-2009)

Treatments	Germination Percentage	Tiller Production (000'/ha.)	Millable Cane Population (000'/ha.)	Cane Yield (t/ha.)	CCS (%)	Sugar Yield (t/ha)
Planting systems (mean values)						
Normal 80 cm apart	162.0	263.3	148.8	136.0	11.60	15.80
Paired row (120+40 cm)	142.0	222.5	129.0	121.1	11.51	l3.95
PR (30+ 30+ 30+ 105 cm)	161.9	231.8	128.5	125.0	11.60	14.56
PR (30+30+30+120 cm)	125.8	219.7	121.0	118.6	11.55	13.71
PR (30+30+ 30+ 135)	120.9	208.3	117.1	113.1	11.59	l3.11
PR (30+30+30+150 cm)	115.5	198.4	111.4	107.4	11.54	12.48
PR (30+ 30+ 30+ 165 cm)	109.9	189.3	107.2	101.9	11.34	11.57
80 cm apart without drip	112.4	195.7	110.8	105.8	11.54	12.21
SEd	**1.073**	**1.267**	**0.883**	**0.762**	**0.13**	**0.217**
CD (P=0.5)	**2.177**	**2.571**	**1.790**	**1.546**	**NS**	**0.473**
Varietal (mean values)						
CoC (SC) 23	138.6	223.5	127.4	120.3	12.69	15.27
CoSi (SC) 6	128.9	210.4	117.5	1l3.6	11.54	13.10
CoC (SC) 22	134.6	223.3	124.9	118.9	10.38	12.42
SEd						
CD (P=0.5)	**0.472**	**0.448**	**0.770**	**0.750**	**0.13**	**0.153**
	1.311	**1.245**	**2.137**	**2.082**	**0.27**	**0.314**

Table 4: Effect of Drip Irrigation and Planting Systems on Growth, Yield and Quality of Sugarcane Varieties —III rd Ratoon (2009-2010)

Treatments	Germination Percentage	Tiller Production (000'/ha.)	Millable Cane Population (000'/ha.)	Cane Yield (t/ha.)	CCS (%)	Sugar Yield (t/ha)
Planting Systems (mean values)						
Normal 80 cm apart	161.6	253.9	150.2	l35.1	12.11	16.36

Table 4: Contd.,						
Paired row (120+40 cm)	143.8	220.5	130.6	116.3	12.16	14.11
PR (30+ 30+ 30+ 105 cm)	l34.0	234.7	129.8	118.8	12.07	14.34
PR (30+30+30+120 cm)	126.3	229.3	123.0	113.0	12.08	l3.66
PR (30+30+ 30+ 135)	120.7	209.2	117.5	108.1	11.99	12.97
PR (30+30+30+150 cm)	114.6	200.3	111.9	101.9	12.02	12.26
PR (30+ 30+ 30+ 165 cm)	110.0	191.0	107.9	97.2	12.33	12.00
80 cm apart without drip	114.4	198.8	112.6	103.2	12.14	12.53
SEd	1.080	0.955	0.653	0.664	0.087	0.086
CD (P=0.5)	2.192	1.937	1.325	1.347	0.188	0.177
Varietal (mean values)						
CoC (SC) 23	134.2	223.6	128.7	115.6	l3.21	15.29
CoSi (SC) 6	125.3	210.9	118.6	108.0	12.24	l3.23
CoC (SC) 22	130.4	223.4	125.9	115.1	10.87	12.49
SEd	0.393	0.385	0.144	0.398	0.060	0.118
CD (P=0.5)	1.092	1.069	0.399	1.107	0.124	1.257